

Claims

- [c1] A process for producing a thermoformable polyurethane foam-containing sound insulative laminate, comprising:
- (1) preparing a foam-forming composition from: (a) from 0 to 100% by weight of total polyol of a graft polyol having a functionality in the range from about 2.5 to 3.5 and a hydroxyl number in the range from about 20 to 70; (b) from 0 to 20% by weight of total polyol of a polyether polyol; (c) a polyisocyanate containing at least 80% by weight toluene diisocyanate and up to 20% by weight methylene diisocyanate; and (d) one or more blowing agents,
- (2) forming the polyurethane foam from the foam-forming composition under controlled pressure conditions from about 0.50 to about 0.95 bar (absolute), wherein the density of the resulting polyurethane foam is 1.3 lb/ft³ or less; and
- (3) joining a layer of the polyurethane foam to a barrier layer to form the sound insulative laminate.
- [c2] The process of claim 1, wherein the polyurethane foam has an IFD₂₅ of 50 lbs or below.
- [c3] The process of claim 1, wherein the foam-forming com-

position includes (e) one or more flame retardants.

[c4] The process of claim 1, wherein the foam-forming composition includes (e) one or more catalysts.

[c5] The process of claim 1, wherein the foam-forming composition includes (e) one or more surfactants.

[c6] The process of claim 1, wherein the foam-forming composition includes (e) from 0 to 20% by weight of total polyol of a polyester polyol.

[c7] The process of claim 1, wherein the foam-forming composition includes (e) one or more additives selected from the group consisting of: stabilizers, antimicrobial compounds, extender oils, dyes, pigments, and antistatic agents.

[c8] The process of claim 1, wherein the blowing agent is water.

[c9] The process of claim 1, wherein the barrier layer is formed of a material selected from the group consisting of: filled asphalt, filled EVA, filled EPDM, filled rubber, filled PVC, and bitumen board.

[c10] The process of claim 1, wherein the polyurethane foam retains a 70% compression set after thermoforming the laminate.

- [c11] The process of claim 1, wherein the polyurethane foam is not pre-treated with a thermoforming agent prior to thermoforming the laminate.
- [c12] A thermoformed article formed from the laminate of claim 1.
- [c13] A sound insulator for an instrument panel, comprising: a flame retardant, thermoformable, flexible, open celled polyurethane foam having a density of 1.0 lb/ft³ or less and an IFD₂₅ of 50 lbs. or less.
- [c14] The sound insulator of claim 13, wherein the foam is in the form of a sheet or slab and a reinforcement, backing or decorative covering is applied to at least one surface of the foam sheet or slab.
- [c15] The sound insulator of claim 14, wherein the reinforcement, backing or decorative covering is applied to a surface of the foam sheet or slab as the foam is thermoformed.
- [c16] The sound insulator of claim 13, wherein the foam is thermoformed under compression at a temperature in the range of about 300°F to about 400°F to form the sound insulator.
- [c17] The sound insulator of claim 16, wherein the thermo-

formed foam retains a 70% compression set.

- [c18] The sound insulator of claim 13, wherein the foam is in the form of a sheet or slab that has a thickness of from about 0.3 to 2.0 inches before it is thermoformed.
- [c19] The sound insulator of claim 13, wherein the foam is not pre-treated with a thermoforming agent prior to thermoforming.
- [c20] The sound insulator of claim 14, wherein the covering is formed of a material selected from the group consisting of: filled asphalt, filled EVA, filled EPDM, filled rubber, filled PVC, and bitumen board.
- [c21] The sound insulator of claim 20, wherein the covering is adhered to the foam with an adhesive prior to thermoforming.